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**PHYSICAL CHARACTERISTICS OF THE INDIANS OF
THE NORTH PACIFIC COAST.**

BY FRANZ BOAS.

During the past summer, when visiting the North Pacific coast, I made a series of measurements of 263 Indians. The tribes included in this series occupy the coasts of Oregon, Washington, and British Columbia, and belong to many linguistic stocks. As the series is not sufficiently large to allow a separate treatment of the individuals of each tribe, I have grouped them together according to their former habitat and, to some extent, according to their mode of life, the tribes living on reservations being separated from those passing much of their time in the canoe. I have distinguished the following groups:

1. Southern Oregon, including principally tribes of Athapaskan affinity, but also a few Klamath, Shasta, etc. The northern limit of this group is situated at Euchre creek.
2. Central Oregon, including the tribes between Euchre creek and Umpqua river.
3. Northern Oregon, including the Yakonan and Salish tribes between Umpqua and Columbia rivers.
4. Columbians, including the tribes in the immediate neighborhood of Columbia river and in the lower Willamette valley.
5. Tribes of Washington, including the whole coast of Washington west of the Cascade Range.
6. Harrison Lake and Lillooet.
7. Vancouver Island.
8. The Bilqula, on the central part of the coast of British Columbia.
9. Tribes of British Columbia north of the last-named group.

Only a short series of measurements of each individual was taken, such as could be made by the removal of only a small portion of the clothing. Following is a list of the measurements:

- | | |
|--------------------------------------|--|
| 1. Stature. | 9. Length of head. |
| 2. Finger-reach. | 10. Width of head. |
| 3. Height of ear. | 11. Jugal width of face. |
| 4. Height of 7th vertebra. | 12. Distance from root of nose to chin. |
| 5. Height of acromion. | 13. Distance from root of nose to mouth. |
| 6. Height of point of second finger. | 14. Height of nose. |
| 7. Width between acromia. | 15. Width of nose. |
| 8. Height when sitting. | |

In discussing the series, I have excluded all males of less than 20 and more than 50 years of age, and all females of less than 19 and more than 50 years of age, the former because they have not reached the adult stage; the latter on account of the incipient changes incident to old age. It may seem that the lower limits are fixed too low, but, as the growth after 19, viz., 20 years, is very slight, the gain in accuracy resulting from the average of a greater number of individuals far outweighs the slight error that is introduced by the immaturity of a certain number of them.

On examining the series, it appears that there are very marked differences between the various local groups. In order to make these differences apparent, a table of those measurements which vary most among the different groups is here presented. In addition to the average, the table contains the limits between which one-half of the series is found—*i. e.*, the probable variation. The last three figures in each column are the finger-reach, height when sitting, and length of arm, expressed in permills of the stature.

I. MALES.

	Southern Oregon.	Central Oregon.	Northern Oregon.	Columbi-ans.	Washing-ton.	Harrison Lake.	Vancouver Island.	Bilqula.	Northern tribes.
Number of observations.....	17	9	7	8	6	9	7	23	7
Stature.....	1623 ± 24	1653 ± 45	1651 ± 33	1699 ± 53	1647 ± 45	1611 ± 37	1635 ± 42	1659 ± 44	1631 ± 18
Finger-reach.....	1693 ± 26	1719 ± 40	1734 ± 36	1792 ± 50	1721 ± 43	1696 ± 47	1758 ± 54	1771 ± 26	1710 ± 18
Height when sitting.....	877 ± 13	914 ± 27	913 ± 18	922 ± 6	899 ± 6	860 ± 21	881 ± 12	890 ± 21	888 ± 13
Length of arm.....	724 ± 16	730 ± 21	729 ± 18	768 ± 24	721 ± 7	723 ± 27	751 ± 22	754 ± 17	737 ± 9
Cephalic index.....	83.2 ± 3.1	82.8 ± 1.8	.....	(82.2 ± 1.4)*	(83.9 ± 1.8)†	89.7 ± 2.1	79.8†	84.1 ± 2.4	79.5 ± 2.4
Facial index.....	85.3 ± 3.0	85.4 ± 4.1	80.3 ± 1.4	82.1 ± 2.3	82.7 ± 3.2	76.0 ± 2.6	83.8 ± 3.9	83.8 ± 2.8	82.8 ± 1.8
Index of width of upper part of face.....	53.2 ± 2.5	53.4 ± 2.9	50.5 ± 1.8	53.1 ± 1.3	53.5 ± 2.6	49.2 ± 2.9	53.8 ± 3.2	53.4 ± 0.9	53.5 ± 5.1
Index of finger-reach.....	1043 ± 11	1040 ± 15	1050 ± 16	1055 ± 10	1056 ± 10	1053 ± 8	1071 ± 25	1069 ± 18	1050 ± 6
Index of height when sitting.....	540 ± 6	553 ± 8	553 ± 4	543 ± 7	547 ± 12	534 ± 4	539 ± 8	537 ± 7	548 ± 8
Index of length of arm.....	446 ± 4	443 ± 10	441 ± 7	446 ± 6	438 ± 5	480 ± 12	459 ± 8	455 ± 8	452 ± 4

II. FEMALES.

	3	6	2	4	9	6
Number of observations.....	.....	.....	.....	.....	.....	.....
Stature.....	1531 ± 28	1567 ± 38	1546	1562 ± 29	1522 ± 24	1568 ± 19
Finger-reach.....	1555 ± 30	1613 ± 48	1606	1602 ± 20	1568 ± 50	1655 ± 46
Height when sitting.....	855	858 ± 13	832	876 ± 22	808 ± 20	850 ± 23
Length of arm.....	663 ± 30	691 ± 18	687	681 ± 25	684 ± 22	718 ± 19
Cephalic index.....	82.7 ± 3.7	82.2 ± 1.1	.....	.....	.....	.....
Facial index.....	83.9 ± 2.4	82.9 ± 2.0	82.4	78.2 ± 2.4	87.9 ± 3.8	.....
Index of width of upper part of face.....	52.5	51.9 ± 1.9	55.5	50.7 ± 1.2	50.8 ± 3.5	83.1 ± 3.2
Index of finger-reach.....	1016 ± 23	1029 ± 12	1038	1032 ± 9	1045 ± 12	53.0 ± 2.8
Index of height when sitting.....	560 ± 11	548 ± 8	539	564 ± 12	531 ± 7	1059 ± 12
Index of length of arm.....	433 ± 21	441 ± 6	444	439 ± 15	449 ± 3	544 ± 5

* 9 boys and men.

† 12 boys.

‡ 3 observations.

Considering the series as a whole, we may describe the population of the North Pacific coast as of average size, ranging, when considered in groups, from 1,611 to 1,699 mm., with short heads and rather wide faces and large chins. Their skin is of light color, and, if protected from sunlight, can hardly be distinguished from that of European brunettes. The hair is of a very dark brown, straight or slightly wavy. The eye almost always has a well-developed plica interna; the eyebrows are wide; the ears coarse, with small lobes.

A study of the distribution of the single observations in each group of the series shows that the groups may be considered as homogeneous, so that we are justified in forming the averages given in the above table.

Although the series are rather small, a number of conclusions may safely be drawn from them. Wherever the series of males and females shows analogous variations these can hardly be due to accident, but it is fair to assume that similar figures would result from a larger series.

Considering the observation on stature, we are struck by the tallness of the Columbians and the small size of the tribes of Harrison lake. A comparison of the series of males and females proves that these averages are trustworthy. When we express the stature of the women in per cents. of that of the men, we obtain the following results:

Southern Oregon.	Central Oregon.	Northern Oregon.	Washing- ton.	Harrison Lake.	Bilqula.
94.3	94.8	93.6	94.2	94.5	94.5

These figures agree very well with each other, and with those expressing the same relation among other races.

It appears that the stature increases as we approach Columbia river from the north and from the south. It is of interest to note that the greater size of the natives of this region has been remarked upon by a number of writers.* We find in this region Sahaptin tribes, who descended from the interior to the coast; the Molalla, part of whom live far inland, and the Chinook, whose territory extends far up Columbia river, so that an intrusion of a taller race coming from the east and settling here becomes very likely. The proportions of the body and of the head of the Columbians present no very marked divergence from those of the neighboring tribes.

* Bancroft, Native Races, Vol. I, p. 254.

They are in the habit of deforming their heads; consequently no conclusions can be drawn from head measurements. The faces of the Columbians are a little wider than those of their neighbors on both sides.

The tribes of Harrison lake, who are remarkable for their short stature, differ fundamentally from all others. The great majority of individuals belonging to these tribes may easily be recognized by their peculiarities. Their heads, although not deformed, are exceedingly wide; their faces very chamæproscopic. These peculiarities may be observed in males as well as in females.

In Vancouver Island is found a group of tribes which resemble closely those of the northern part of the coast of British Columbia. They are characterized by a size ranging between that of the tribes of northern and those of southern Oregon, and by a much longer head than is found anywhere farther south. The index of the three individuals of Vancouver Island is 79.9; that of the seven individuals belonging to northern tribes, 79.5. This interesting fact is confirmed by measurements of skulls from these regions. I published in the *Verh. der Berliner Ges. f. Ethnol.*, 1890, p. 30, measurements of a series of 10 undeformed crania from the southeastern part of Vancouver Island. These give an average index of 77.7. To this may be added a skull described by Flower* belonging to the west coast of Vancouver Island, which has an index of 77.4. If we allow, according to Broca, 2 per cent. difference between the cranium and the head of living individuals, we find that the results of these series agree very closely. We have also a series of measurements belonging to the northern part of the coast of British Columbia. Four Tsimshian skulls have been described by me.† Three others have been described by Barnard Davis. Still another has been described by the same author as a "round head" from Vancouver Island (p. 229). Finally, I measured a Haida cranium in the Provincial Museum of Victoria, B. C. The average of these 9 skulls gives 78.4. It will be seen that all these values agree very closely, and confirm the results obtained on the living individuals.

It is very remarkable that we find located between these two homogeneous groups a somewhat taller and much more brachycephalic

* W. H. Flower, Catalogue of the Specimens illustrating the Osteology, etc., in the Museum of the Royal College of Surgeons, p. 148.

† Report to the B. A. A. S. on the tribes of British Columbia, 1889, p. 16.

people—the Bilqula. Fortunately the series of measurements on this tribe is sufficiently large to give the result a high degree of probability. North of British Columbia we find the Tlingit, also considerably taller than the tribes of northern British Columbia, and much more short-headed. Unfortunately no satisfactory series of measurements of this people is accessible to me. As there is a constant intercourse between the various tribes of this region, and as the conditions of life of all of them are uniform, we must assume that these differences are racial characters. Our knowledge of the native tribes of the interior of British Columbia is very limited, but we may adduce some material from the most southern part of this region. Seven skulls from Lytton, B. C., which are in the Museum of the Geological and Natural History Survey of Canada, in Ottawa; one from the same place, which is in my possession, and two Shushwap skulls described by Barnard Davis, give an average cephalic index of 78.9. A single Shushwap whom I measured in New Westminster has a cephalic index of 82.9, corresponding to about 80.9 on the skull.

On account of the remarkable differences in the cephalic indices of these various groups of tribes, it would be of great interest to know the natural form of head of the tribes of northern Vancouver Island, of the delta of Fraser river, of Puget Sound, and of northern Oregon. Unfortunately all of them deform their heads. On Fraser river, on Puget Sound, and north of Columbia river this custom is, however, dying out, and I was able to measure a series of children. Twelve boys from Puget Sound give an average of 83.9, with a probable variation of 1.8; thirteen from Fraser river give an average of 87.3, with a probable variation of 2.0. Although the results obtained by measuring boys are not identical with those obtained by measuring adults, the difference is probably not very great. At least the results of the measurement of the cephalic indices of 13 boys from southern Oregon are almost identical with the results obtained from the measurement of 17 adults. According to these figures, the Indians of Puget Sound would have to be grouped in close connection with those of central Oregon; those of Fraser river with the tribes of Harrison lake. The Bilqula resemble the tribes of Puget Sound and of northern and central Oregon.

It appears, therefore, that there is a comparatively uniform, mesocephalic population on Vancouver Island and on the coast of British Columbia, with the exception of Fraser river and Bentinck Arm.

The latter are at the same time the regions where intermarriage with the Athapaskan tribes of the interior has been frequent. We know that the Bilqula have intermarried very extensively with the Carriers and Chilcotin; the Lillooet with the latter. Therefore it would appear that brachycephalism becomes more frequent in those regions where intermixture with Athapaskans makes itself felt. In order to strengthen or to refute this theory, it would be necessary to obtain measurements of the Sishiatl, of Jarvis Inlet, and of the upper Tsimshian, both of whom are in close contact with Athapaskans. The Tlingit, of Alaska, who are immediate neighbors of Athapaskan tribes, are also more brachycephalic than the tribes of the coast of British Columbia, and their stature seems to be higher. There can be little doubt that among the Athapaskans on the whole brachycephalism is very frequent. Quatrefages and Hamy* mention seven skulls from various Athapaskan tribes of Canada, and find them to be brachycephalic. The proportions of their faces, also, closely resemble those of the Bilqula and the other tribes discussed in the present paper. I had occasion to question a number of former officers of the Hudson Bay Company regarding the general appearance of the Athapaskans of the interior of British Columbia and of the Mackenzie Basin. According to their descriptions, the Athapaskans resemble the tribes of the northwest coast much more closely than the Algonquin. For these reasons, as well as on account of the form of their language and a number of customs and beliefs, I am inclined to class the Athapaskans as one of the peoples of the north Pacific coast. A good series of measurements from the Mackenzie Basin would decide this question. The almost complete absence of Dolichocephali—at least, according to the present state of our knowledge—distinguishes them most clearly from the eastern group—the Algonquin and Iroquois—as well as from the central and eastern Eskimo.

The divergence of the tribes of Harrison lake from all their neighbors is very curious, more especially the high degree of brachycephalism and of chamæprosopy. The width of both head and face is much greater than is found in any other tribe. Their small stature is also quite unique. If I should include three men of about 55 years in the series, the average would be less than 1,600 mm. I may mention here that three tibiæ and femora which I collected at Lytton with the mesocephalic skulls mentioned above are very small.

* *Crania ethnica*, p. 470.

Assuming the tibia to be about 22 per cent., the femur 27 per cent. of the stature, the three individuals would have measured about 1,430, 1,500, and 1,560 mm., thus corresponding in size to the females of the Harrison lake series. This, however, is, of course, a very unsatisfactory comparison.

We will finally consider the proportions of the bodies of the various groups. It appears that the finger-reach of the southern tribes, especially of those of southern and central Oregon, is much smaller than that of the northern tribes. I am inclined to attribute this to a difference in occupation, the two first-named groups living on reservations, while the others are fishermen. Hand in hand with this lengthening of the finger-reach seems to go an increase in the length of the arm. These variations may be seen in males as well as in females. The latter also pass much of their time in the canoe. The table shows that the trunk of these Indians is much longer than that of Europeans, and also longer than that of the Iroquois, which, according to Gould, is 53.4 per cent. It seems that the trunk of the southern groups is longer than that of the northern ones.

It is of the greatest interest to observe that upon studying the physical characters of the tribes of the Pacific coast in detail such a variety of forms is found. Each tribe appears composed of many types, but in each we find a marked prevalence of a certain type. Unfortunately we have hardly any detailed studies on the physical characters of living Indians, and yet these studies are just as important as those on languages, customs, and beliefs. The disappearance of tribes, their intermixture with each other, and with whites, the changes in their mode of life, are so rapid that little time remains for studies of this character.

BANANA CULTIVATION AMONG THE NATIVES OF NEW GUINEA.—Sir William Macgregor, governor of British New Guinea, in his recent exploration of the Fly river, found that the natives of the large island of Kawai, in the delta of that river, gave much attention to the cultivation of the banana. In a vocabulary of their language which he compiled there is a list of not fewer than thirty-six varieties of banana, and from personal experience he testifies that the distinctions were not fanciful, but indicate real, substantial differences. This is among a people whose sole utensil, used as bucket, basin, bowl, and plate, is a large slipper shell. (Proc. Roy. Geog. Soc., June, 1890, p. 354.)